WE CLAIM:

1. A method for compensating for lens aberrations, said method comprising the steps of:

(a) defining a cost metric which quantifies an imaging performance of an imaging system, said cost metric reflecting the effects of lens aberrations on said imaging performance;

(b) defining a source illumination profile;

(c) evaluating said cost metric based on said source illumination profile;

(d) modifying said source illumination profile, and re-evaluating said cost metric based on said modified source illumination profile; and

(e) repeating step (d) until said cost metric is minimized.

2. The method for compensating for lens aberrations according to claim 1, wherein the result of evaluating said cost metric is a single numerical value representing the imaging performance of said imaging system.

3. The method for compensating for lens aberrations according to claim 1, further comprising the step of forming a diffractive optical element, said diffractive optical element implementing said source illumination profile corresponding to the minimized cost metric.

4. The method for compensating for lens aberrations according to claim 1, wherein said cost metric further reflects exposure latitude performance of the imaging process.

5. A method for compensating for lens aberrations in an imaging system having an illumination source for illuminating a reticle and a projection lens for projecting light diffracted by said reticle onto a substrate, said method comprising the steps of:

(a) defining a cost metric which quantifies an imaging performance of said imaging system, said cost metric reflecting the effects of lens aberrations of said projection lens on said imaging performance;

(b) defining a source illumination profile defining the light illuminated on said reticle;

(c) evaluating said cost metric based on said source illumination profile;

(d) modifying said source illumination profile, and re-evaluating said cost metric based on said modified source illumination profile;

(e) repeating step (d) until said cost metric is minimized;

(f) selecting said source illumination profile corresponding to said minimized cost metric as the profile for illuminating said reticle.

6. The method for compensating for lens aberrations in an imaging system, according to claim 5, wherein the result of evaluating said cost metric is a single numerical value representing the imaging performance of said imaging system.

7. The method for compensating for lens aberrations in an imaging system according to claim 5, wherein said cost metric further reflects exposure latitude performance of the imaging process.

8. A method for designing a diffractive optical element for use in an imaging system, said method comprising the steps of:

(a) defining a cost metric which quantifies an imaging performance of an imaging system, said cost metric reflecting the effects of lens aberrations on said imaging performance;

(b) defining a source illumination profile;

(c) evaluating said cost metric based on said source illumination profile;

(d) modifying said source illumination profile, and re-evaluating said cost metric based on said modified source illumination profile;

(e) repeating step (d) until said cost metric is minimized; and

(f) generating said diffractive optical element which implements said source illumination profile corresponding to said minimized cost metric.

9. The method for designing a diffractive optical element according to claim 8, wherein the result of evaluating said cost metric is a single numerical value representing the imaging performance of said imaging system.

10. A computer program product for controlling a computer comprising a recording medium readable by the computer, means recorded on the recording medium for directing the computer to generate files corresponding to a diffractive optical element for use in an imaging system, said generation of the files comprising the steps of:

(a) defining a cost metric which quantifies an imaging performance of an imaging system, said cost metric reflecting the effects of lens aberrations on said imaging performance;

(b) defining a source illumination profile;

(c) evaluating said cost metric based on said source illumination profile;

(d) modifying said source illumination profile, and re-evaluating said cost metric based on said modified source illumination profile;

(e) repeating step (d) until said cost metric is minimized; and

(f) defining said diffractive optical element which implements said source illumination profile corresponding to said minimized cost metric.

11. The method for compensating for lens aberrations according to claim 1, wherein said cost metric includes depth of focus performance of the imaging process.

12. The method for compensating for lens aberrations in an imaging system according to claim 5, wherein said cost metric includes depth of focus performance of the imaging process.